

Serial No.: 10/604,327
Confirmation No.: 1326
Applicants: HÄGGANDER, Jan *et al.*
Atty. Ref.: 07589.0119.PCUS00

AMENDMENTS TO THE CLAIMS:

1. (Presently Amended) A liquid fuel rocket engine member (10) comprising:

a body having an axis of revolution and a cross section that varies in diameter along said axis, said body further comprising a wall structure having a plurality of cooling channels (11,19,20); and

an outside of the wall structure comprising a continuous sheet metal wall (14) and the cooling channels (11)-being at least partly delimited by elongated elements (15,18,21)-that are longitudinally attached to the inside of the sheet metal wall, the elongated elements (15,18)-being mounted with mutual contact at the inlet end (12) of the member and with mutual gaps distances at the outlet end (13) of the member.

2. (Presently Amended) The liquid fuel rocket engine member as recited in claim 1, further comprising:

a cross sectional area of each cooling channel being larger in a downstream end (13)-of the channel than in an upstream end (12)-of the channel.

3. (Presently Amended) The liquid fuel rocket engine member as recited in claim 1, further comprising:

a material thickness of the cooling channel wall being larger in a downstream end (13)-of the channel than in an upstream end (12).

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4. (Presently Amended) The liquid fuel rocket engine member as recited in claim 1, further comprising:

 a width of each of said cooling channels, in the circumferential direction of said engine member, being larger in a downstream end (13) of the channel than in an upstream end (12) of the channel.

5. (Presently Amended) The liquid fuel rocket engine member as recited in claim 1, further comprising:

 the cooling channels (11) having a substantially similar cross section shape in a downstream end (13) of the channel as in an upstream end (12) of the channel.

6. (Cancelled)

7. (Presently Amended) The liquid fuel rocket engine member as recited in claim 1, further comprising:

 the cooling channels being formed by seamless tubes (15).

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8. (Presently Amended) The liquid fuel rocket engine member as recited in claim 1, further comprising:

 a distance between two adjacent elongated elements ~~(15,18)~~ at the outlet end ~~(13)~~ of the member ~~(10)~~ being filled with an insulating material ~~(17)~~.

9. (Presently Amended) The liquid fuel rocket engine member as recited in claim 1, further comprising:

a the distance between two adjacent elongated elements ~~(15,18)~~ at the outlet end ~~(13)~~ of the member ~~(10)~~ being filled with a thermally conductive material ~~(17)~~.

10. (Cancelled)

11. (Cancelled)

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12. (Presently Amended) A method for manufacturing a liquid fuel rocket engine member (10) comprising:

providing a body having an axis of revolution and a cross section that varies in diameter along said axis, and the body having a wall structure comprising a plurality of cooling channels (11);

attaching a plurality of elongated elements to a curved sheet metal wall arranged to form the engine member, wherein the cooling channels are formed by at least said elongated elements and wherein the elongated elements (15,18) are mounted with mutual contact at the inlet end (12) of the member and with mutual gaps distances at the outlet end (13) of the member.

13. (Presently Amended) The method as recited in claim 12; further comprising:

forming a sheet metal wall (14) having a wall section corresponding to the desired member section.

14. (Cancelled) The method as recited in claim 12; further comprising:

defining the cooling channels by said sheet metal wall (14).

15. (Presently Amended) The method as recited in claim 12; further comprising:

attaching the cooling channels (11) to the sheet metal wall (14) by welding from the outside of the wall.

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16. (New) A liquid fuel rocket engine member comprising:

a body having an axis of revolution and a cross section that varies in diameter along said axis, said body further comprising a wall structure having a plurality of cooling channels; and
an outside of the wall structure comprising a continuous sheet metal wall and the cooling channels being at least partly delimited by elongated elements that are longitudinally attached to the inside of the sheet metal wall, the elongated elements being mounted with mutual gaps at the inlet end of the member that expand to greater mutual gaps at the outlet end of the member.

17. (New) The liquid fuel rocket engine member as recited in claim 16, further comprising:

a cross sectional area of each cooling channel being larger in a downstream end of the channel than in an upstream end of the channel.

18. (New) The liquid fuel rocket engine member as recited in claim 16, further comprising:

a material thickness of each cooling channel wall being larger in a downstream end of the channel than in an upstream end.

19. (New) The liquid fuel rocket engine member as recited in claim 16, further comprising:

a width of each of said cooling channels, in the circumferential direction of said engine member, being larger in a downstream end of the channel than in an upstream end of the channel.

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20. (New) The liquid fuel rocket engine member as recited in claim 16, further comprising:
said cooling channels having a substantially similar cross section shape in a downstream
end of the channel as in an upstream end of the channel.

21. (New) The liquid fuel rocket engine member as recited in claim 16, further comprising:
said cooling channels being formed by seamless tubes.

22. (New) The liquid fuel rocket engine member as recited in claim 16, further comprising:
a distance between two adjacent elongated elements at the outlet end of the member
being filled with an insulating material.

23. (New) The liquid fuel rocket engine member as recited in claim 16, further comprising:
a distance between two adjacent elongated elements at the outlet end of the member
being filled with a thermally conductive material.

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24. (New) A liquid fuel rocket engine member comprising:

a body having an axis of revolution and a cross section that varies in diameter along said axis, said body further comprising a wall structure including a plurality of cooling channels; and said wall structure comprising a sheet metal wall with said plurality of cooling channels being mounted at an inside of said sheet metal wall with mutual contact between adjacent cooling channels at inlet ends thereof and with mutual gaps therebetween at outlet ends thereof.

25. (New) The liquid fuel rocket engine member as recited in claim 24, further comprising:

a cross sectional area of each cooling channel being larger in a downstream end of the channel than in an upstream end of the channel.

26. (New) The liquid fuel rocket engine member as recited in claim 24, further comprising:

a material thickness of each cooling channel wall being larger in a downstream end of the channel than in an upstream end.

27. (New) The liquid fuel rocket engine member as recited in claim 24, further comprising:

a width of each of said cooling channels, in the circumferential direction of said engine member, being larger in a downstream end of the channel than in an upstream end of the channel.

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28. (New) The liquid fuel rocket engine member as recited in claim 24, further comprising:
said cooling channels having a substantially similar cross section shape in a downstream
end of the channel as in an upstream end of the channel.

29. (New) The liquid fuel rocket engine member as recited in claim 24, further comprising:
said cooling channels being formed by seamless tubes.

30. (New) The liquid fuel rocket engine member as recited in claim 24, further comprising:
a distance between two adjacent elongated elements at the outlet end of the member
being filled with an insulating material.

31. (New) The liquid fuel rocket engine member as recited in claim 24, further comprising:
a distance between two adjacent elongated elements at the outlet end of the member
being filled with a thermally conductive material.